

## RA Cairncross Trip Summary – Ecuador and El Salvador

July 18-29, 2009

Schedule:

**Viernes 23 de julio – visita la universidad de san francisco de Quito in Quito Ecuador**



<http://www.usfq.edu.ec/calgary/indexhome.html>

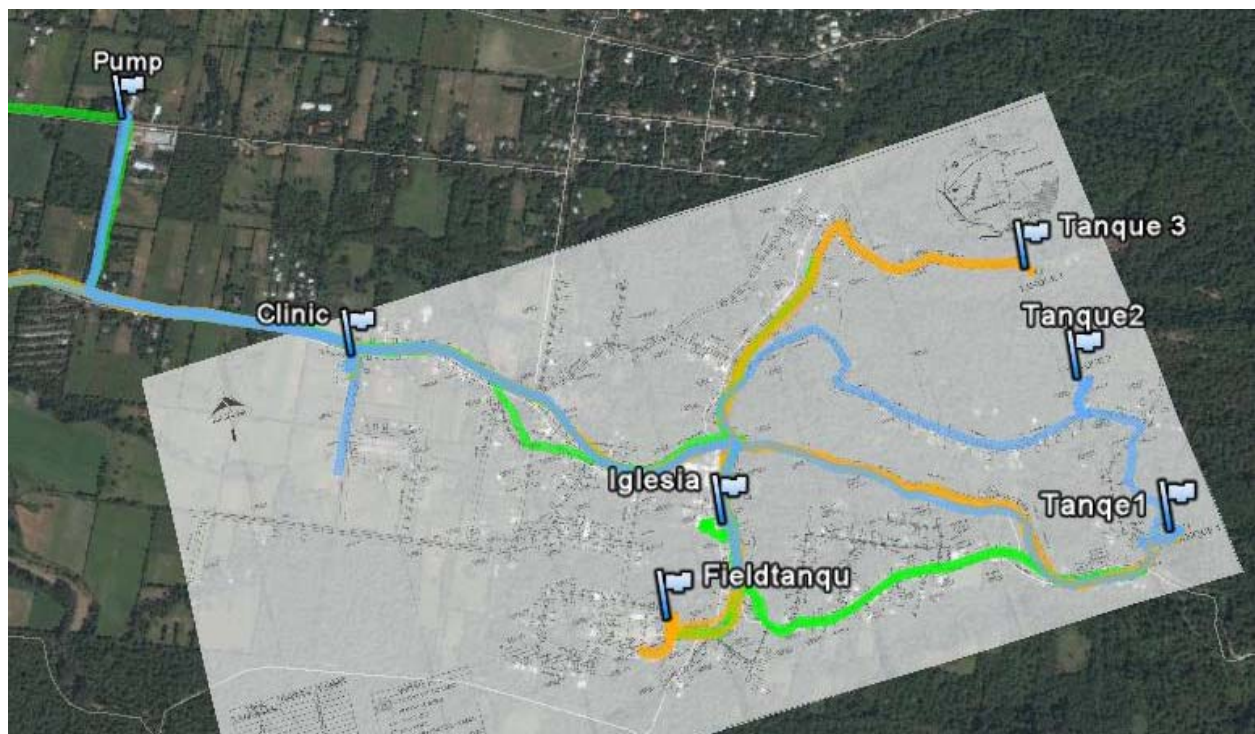
Met with the director of the Masters in Renewable Energy Program, Rodny Penafiel. Presented a talk on biodiesel production, “Diseño de un Reactor para la Producción de Biodiesel de los Ácidos Grasos” (slides in Spanish but spoke in English). Ate lunch with students in the program – including Regina Cagle and Drexel graduate in environmental engineering.

**Sábado 18 de julio – viajar a San Salvador, El Salvador por Panama City**

- visita a la comunidad de Las Delicias

- se aloja en el casa del huésped de proyecto FIAT

Toured community of Las Delicias to get an overview of the water system and problems.



**Domingo 19 de julio - visita a Las Delicias - se aloja en la casa del huésped de proyecto FIAT**

Performed pump flow tests in Las Delicias to determine flowrates for two storage tanks in the community. Met with the community governing body to discuss the water project and explore methods to collaborate on projects.



**Lunes 20 de julio - visita a la comunidad de Las Delicias de la mañana**

- asiste a COLAEIQ por la tarde y la noche

- se aloja en el hotel de la conferencia- Hilton Princess San Salvador

Walked throughout community with Chilo, the person in charge of managing the water supply (by switching valves at appropriate times) and discussed water maintenance strategy.



Attended opening reception for Congress of Latin American Students of Chemical Engineering. Met faculty and students from several universities in El Salvador.

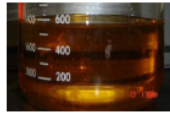


**Martes 21 de julio - asiste a COLAEIQ - se aloja en el hotel de la conferencia.**

Attended a short-course on traditional biodiesel production at the universidad centroamericana de jose simeon canas (UCA) in San Salvador. The short-course was led by Leonel Hernandez, a chemical engineering professor at UCA. Presented a talk on biodiesel production, “Diseño de un Reactor para la Producción de Biodiesel de los Ácidos Grasos” (both slides and speaking in Spanish).



## Diseño de un Reactor para la Producción de Biodiesel de los Ácidos Grasos



Cory Melick, Minhazuddin Mohammed, Richard Cairncross  
Drexel University, Chemical & Biological Engineering  
Filadelfia, Pennsylvania 19104 E.E.U.U



### Miércoles 22 de julio - asiste a COLAEIQ - se aloja en el hotel de la conferencia

Attended a short course on biodiesel production and collaborated with students from Chile on experiments to produce biodiesel.



Visited the company headquarters for La Geo with Salvador Handal for the afternoon. La Geo is a large geothermal power company in El Salvador and supplies approximately 25% of the electricity used in El Salvador. Salvador Handal is a geophysicist who is working on a variety of renewable energy projects in El Salvador.



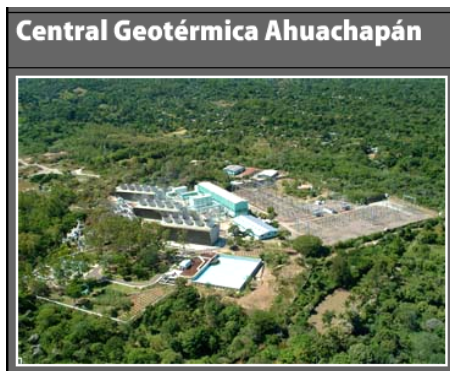
### **Jueves 23 de julio - asiste a COLAEIQ - se aloja en el hotel de la conferencia**

Attended presentations at the conference and met students and faculty from many latin american countries. Specifically made connections with faculty from Puerto Rico, Nicaragua, Ecuador and Columbia that could develop into future collaborations.

### **Viernes 24 de julio – se reúne con Salvador Handal &- se aloja con John McCormack**

Traveled to Ahuachapan with students to visit La Geo geothermal electric plant. The plant produces more than 10% of the electricity used in El Salvador. The plant site also has a pilot-plant for solar-thermal steam generation using parabolic troughs and will be the future site of a pilot-scale biodiesel plant.

<http://www.lageo.com.sv/index.php>



Met with Salvador Handal to review hydrogeological study of Miramar and La Ceiba to decide on optimal strategy for obtaining quotes for wells and completing the water supply project. Salvador collaborated with Arturo Quezada, a hydrogeologist, to complete a hydrogeological study of Miramar and La Ceiba in May for the EWB chapters at Rowan University and Drexel University.

### **Sábado 25 de julio – visita a Miramar con Salvador Handal (Hydrogeologist) and Luis Palomo(well driller) – se aloja con John McCormack**

Traveled to Miramar El Salvador with Salvador Handal and Luis Palomo in order to view sites for well drilling. Visited a water supply system in Nueva Esperanza and met with the water system manager to discuss mechanisms for water system management. Visited Miramar briefly and talked with several community leaders to communicate to them that we are working on the water supply project and hope to implement within the next year.



### Domíngoo 26 de julio - se aloja en hotel El Torogoz

A day off – visited the volcano El Baqueron with McCormack family and visited two sites of Incan ruins near San Salvador.



### **Lunes 27 de julio – visita a el embajada & UES - se aloja en hotel El Torogoz**

Visited Fernando Herrera (Cultural Affairs Specialist) and Marti ¿? (Public Affairs Officer) at the US Embassy in El Salvador <http://sansalvador.usembassy.gov/> . Later visited the University of El Salvador (UES or “la nacional”, <http://www.ues.edu.sv/> ). Beatriz Recinos (a student from UES) showed me several guest houses that would be appropriate for lodging and helped with translation. UES is closed all of this week because of the H1N1 flu – the government needed to take some action to show they are trying to combat the flu and closing schools for two weeks was the easiest. Because the school was closed it was difficult to get onto the campus, but the embassy helped and eventually we got in and met with Reynaldo Lopez (Dean) and Mario Orellana (vice-Dean) in the Agricultural Sciences Department. We discussed plans for a diplomado in renewable energy – a diplomado is a certificate program for university students, faculty, and people from industry which could be the basis for a renewable energy masters degree. There are several faculty from UES who can collaborate on teaching the diplomado.



### **Martes 28 de julio – visita a UES - se aloja en hotel El Torogoz**

Because UES was closed this was a day of relaxation and sightseeing. I walked the neighborhoods around UES and met some locals – they were helpful with recommendations of where to live close to UES.

Met with Fernando Ramirez, the department head of Chemical Engineering at a restaurant near the entrance to the university. Discussed the differences between Chemical Engineering at UES and Drexel.

### **Miércoles 29 de julio – salida de El Salvador**

Returned to Philadelphia.